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ABSTRACT

This document represents one of a series of continuing reports on student flow in Hawaii community colleges. The purpose of this study was to explore the relationship of student scores on the Nelson-Denny Reading Test (NDRT) to academic performance as reflected by grade point averages (GPA). NDRT scores for 1,981 entering students at Leeward Community College in 1975 provided the data used in the study. Analysis of student scores on the NDRT Vocabulary section revealed that highest mean scores were found among older students, married students, graduates of mainland high schools, liberal arts majors, students with GPA's of at least 3.5, and continuing students. Analysis of student scores in the NDRT Comprehension section revealed that highest mean scores were found among females, younger students, single students, graduages of Hawaii's private schools, liberal arts majors, students with GPA's of at least 3.5, and continuing students. Correlation coefficients between GPA and Vocabulary scores and between GPA and Comprehension scores were .224 and .111, respectively. A correlation coefficient of .664 was found between Vocabulary and Comprehension scores. Results indicated that students differed significantly in performance on the total NDRT by the following characteristics: sex, age, high school background, educational objective, curriculum program, grade point average, and continuing/non-continuing status. (JDS)

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ANALYSIS OF NELSON-DENNY READING TEST SCORES
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Report No. 13

Student Flow Project

October 1976

Office of the Chancellor for Community Colleges
Educational Services Division
University of Hawaii

JC 760 571

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A. Introduction

The community colleges of the University of Hawaii do not administer entrance examinations, but most use various kinds of tests for placement purposes and/or for admission to specific programs. Since it is commonly assumed that such tests have an effect on academic performance, as reflected in grade point average, we were interested in exploring this area as part of the Student Flow Project.

An informal poll of placement tests used by our seven campuses was made by the Coordinator of Student Services (see Appendix). Although the Nelson-Denny Reading Test is being used on four campuses (Kapiolani, Kauai, Leeward and Windward), we decided to analyze scores for Fall 1975 new students at Leeward Community College since it administers this test, Form D, to all new students for placement into developmental reading and writing courses.[1]

B. Findings

The Nelson-Denny Reading Test is composed of two parts: Vocabulary and Comprehension. We developed correlation coefficients between these scores and cumulative grade point averages. We also used analysis of variance in studying the mean scores of students based on the various characteristics used in our study of continuation/non-continuation rates in the community colleges. SPSS (Statistical Package for the Social Sciences) was used in deriving tests of statistical significance and correlations.

In Fall 1975, Leeward Community College had 1,948 new students, and test scores were made available by the college for 1,981 students. There was a match of 1,526 students between both this file and our records in the Student Flow Project.

1. Summary of Scores

Table 1 presents the mean scores on the Vocabulary and Comprehension sections of the Nelson-Denny Reading Test, by program, for the students included in this study:

a. The mean Vocabulary score was 28 for the entire group, ranging from 19 (Public Services and Hotel/Food Services) to 29 (Liberal Arts).

b. The mean Comprehension score was 35 for the total with a range from 27 (Public Services) to 36 (Liberal Arts).

c. The mean total score on the Nelson-Denny Reading Test was 63 for the entire group; the range was 46 (Public Services) to 65 (Liberal Arts). Total scores ranging from 47-53 are equivalent to 10th grade reading level; 54-58, 11th grade; 59-67, 12th grade.

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[1] Windward Community College also administers the Nelson-Denny Reading Test to all incoming students, but Leeward was selected for this study because of its longer experience with the test and larger entering class. For information on the scores of Leeward students on this test from 1970 to 1975, see: Leeward Community College, Office of Institutional Research, Master File Feasibility Study (June 1976).

TABLE 1
MEAN SCORES ON THE NELSON-DENNY READING TEST, BY PROGRAM
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Program	Vocabulary	Comprehension	Total
TOTAL	27.9	34.7	62.5
Liberal Arts	28.9	35.6	64.5
Business	24.9	33.8	58.7
Hotel/Food Svcs.	19.1	27.6	46.7
Public Svcs.	19.0	26.8	45.8
Technology	24.4	31.4	55.8
Other	27.5	32.6	60.1

2. Vocabulary Scores (Mean: 27.9)

Scores on the Vocabulary section were analyzed, by sex, age, marital status, high school background, educational objective, program, cumulative grade point average, and continuation/non-continuation status in Spring 1976. The results are summarized in Table 2 in terms of those characteristics where statistically significant differences were found.

TABLE 2
VOCABULARY SECTION: RANGE IN MEAN SCORES, BY CHARACTERISTICS
ON WHICH STUDENTS DIFFERED SIGNIFICANTLY
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Note: Level of statistical significance is shown as follows:
* .05 level
** .01 level
*** .001 level
Includes data only for groups of 5 or more students.

Characteristics	Highest Mean Score	Lowest Mean Score
Age***	31.8 Over 29 years	24.9 19-21 years
Marital Status***	31.5 Married	26.9 Single
High School Background***	37.7 U. S. Mainland	19.9 Public, Maui
Educational Objective***	28.9 Assoc. Arts	17.3 Certificate
Program***	28.9 Liberal Arts	19.0 Public Svcs.[a]
Grade Point Average***	33.8 3.5 and above	23.9 Below 2.0
Cont./Non-Cont. Status***	28.4 Continuing	25.1 Non-Continuing

[a]Hotel/Food Svcs: 19.1

Highest (higher) mean scores were found among:

a. older students as reflected in age and marital status;

b. graduates of Mainland high schools;

c. liberal arts majors;

d. students with grade point averages of at least 3.5;

e. continuing students in Spring 1976.

The students with the highest mean score (38) on the Vocabulary section were Mainland high school graduates and those with grade point averages of 3.5 and above (34).

3. Comprehension Scores (Mean: 34.7)

Scores on the Comprehension section were analyzed, and the results, by student characteristics, are found in Table 3.

TABLE 3
COMPREHENSION SECTION: RANGE IN MEAN SCORES, BY CHARACTERISTICS ON WHICH STUDENTS DIFFERED SIGNIFICANTLY
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Note: Level of statistical significance is shown as follows:
* .05 level
** .01 level
*** .001 level
Includes data only for groups of 5 or more students.

Characteristics	Highest Mean Score		Lowest Mean Score	
Sex***	36.1	Female	33.6	Male
Age***	36.6	Below 19	29.1	Over 29
Marital Status***	35.5	Single	31.1	Married
High School Background***	39.1 38.5	No data Private, HI State	25.1	Foreign
Educational Objective***	35.6	Assoc. Arts	28.9	Certificate
Program***	35.6	Liberal Arts	26.8	Public Svcs.
Grade Point Average***	36.1	3.5 and above	32.7	Below 2.0
Cont./Non-Cont. Status**	35.2	Continuing	33.1	Non-Continuing

Highest (higher) mean scores were found among:

a. females;

b. younger students as reflected in age and marital status;

c. graduates of Hawaii's private high schools;

d. liberal arts majors;

e. students with grade point averages of at least 3.5;

f. continuing students in Spring 1976.

The range in mean scores on the Comprehension section was especially great among students, by high school background, by educational objective, and by program.

4. Total Scores (Mean: 62.5)

Total reading scores were determined, and Table 4 presents the results of our analysis.

TABLE 4
READING TOTAL: RANGE IN MEAN SCORES, BY CHARACTERISTICS ON WHICH STUDENTS DIFFERED SIGNIFICANTLY
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Note: Level of statistical significance is shown as follows:
* .05 level
** .01 level
*** .001 level
Includes data only for groups of 5 or more students.

Characteristics	Highest Mean Score	Lowest Mean Score
Sex*	63.8 Female	61.3 Male
Age**	63.8 Below 19	57.1 19-21 years
High School Background***	75.1 No data 74.9 U. S. Mainland	45.3 Foreign
Educational Objective***	64.5 Assoc. Arts	46.2 Certificate
Program***	64.5 Liberal Arts	45.8 Public Svcs.
Grade Point Average***	69.9 3.5 and above	56.6 Below 2.0
Cont./Non-Cont. Status***	63.5 Continuing	58.2 Non-Continuing

The highest (higher) total reading scores were found among:

a. females;

b. students below 19 years of age;

c. graduates of Mainland high schools;

d. liberal arts majors;

e. students with grade point averages of at least 3.5;

f. continuing students in Spring 1976.

Total scores on the Nelson-Denny Reading Test are oftentimes expressed in grade equivalents. Based on these norms, the groups with the highest mean scores had means equivalent to the 12th grade level (59-67) or above. Some of the groups with the lowest mean scores (students who graduated from foreign high schools, those whose educational objective was a certificate, those majoring in public services) had means equivalent to the 9th grade level (41-46).

5. Relationships between Grades and Reading Scores

We were interested in studying the relationships between cumulative grade point averages of students and their scores on the Vocabulary and Comprehension sections of the Nelson-Denny Reading Test. For example, do students with the high grade point averages also have high test scores?

We had data for 1,339 students, and their grade point averages and mean scores are summarized in Table 5.

TABLE 5
STUDENTS ON WHICH CORRELATIONS ARE BASED, BY PROGRAM
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Program	No. of Students	Cum. GPA	Mean Scores	
			Vocabulary	Comprehension
TOTAL	1,339	2.8	28.1	35.0
Liberal Arts	1,000	2.8	29.4	35.9
Vocational Educ.	305	2.7	23.9	32.1
Business	(157)	(2.8)	(25.3)	(34.3)
Hotel/Food Svcs.	(30)	(2.4)	(18.9)	(27.3)
Public Svcs.	(22)	(3.0)	(19.3)	(26.7)
Technology	(96)	(2.7)	(24.3)	(31.1)
Other	34	3.0	29.6	34.1

The following positive correlation coefficients were found for:

--cumulative grade point averages and Vocabulary scores: .224

--cumulative grade point averages and Comprehension scores: .111

It is not surprising that the correlation between Vocabulary scores and Comprehension scores (.664) was higher than that between test scores and cumulative grade point average.[2] What is noteworthy is the comparatively low correlation for the latter. An analysis, by program, was therefore conducted with ranges in correlation as follows (Table 6):

a. between grade point average and Vocabulary scores: .08 (Hotel/Food Services) to .36 (Public Services).

b. between grade point average and Comprehension scores: .08 (Liberal Arts) to .22 (Business).

c. between Vocabulary and Comprehension sections: .55 (Business) to .76 (Hotel/Food Services).

TABLE 6
CORRELATIONS OF GRADE POINT AVERAGE AND NELSON-DENNY TEST SCORES, BY PROGRAM
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Program	No. of Students	Grade Point Average and: Vocabulary	Comprehension	Vocabulary and Comprehension
TOTAL	1,339	.224	.111	.664
Liberal Arts	1,000	.210	.080	.666
Vocational Educ.	305	.264	.191	.618
Business	(157)	(.294)	(.217)	(.548)
Hotel/Food Svcs.	(30)	(.074)	(.148)	(.755)
Public Svcs.	(22)	(.358)	(.125)	(.575)
Technology	(96)	(.261)	(.143)	(.665)
Other	34	.172	.089	.713

[2]Although data are summarized for 1,526 students in this report, our analysis of correlations is based on 1,339 students. 187 students were not included because their grade point averages were "0.00" for several reasons. Students may have received only the following grades which are not computed in the grade point averages: (a) "W" (withdrawal) grades; (b) C/NC (credit/no credit) grades; (c) "N" grades (no grade); (d) "I" (incomplete) grades; or (e) "Q" grades (credit given for meeting general education requirements in non-transfer programs).

The Examiner's Manual, Nelson-Denny Reading Test, includes the following pertinent data:[3]

a. The intercorrelation between the Vocabulary and Comprehension sections on the 13th grade level was .671. (The correlation we derived in our study is very similar -- .664.)

b. Unpublished data from the Office of Admissions, University of Minnesota, indicate the following correlations for over-all grade point average and:

--Nelson Denny Test scores	.397
--High school rank	.585
--Minnesota Scholastic Aptitude Test	.384

c. Correlations for Nelson-Denny Reading Test sections and first quarter performance of freshmen at the University of Minnesota, St. Paul Campus, were:

Course	Vocabulary	Comprehension	Total
Agriculture	.37	.34	.37
Home Economics	.24	.34	.33
Forestry	.34	.29	.36

It is evident that the correlations for grade point average and Nelson-Denny Reading Test scores based on the Vocabulary and Comprehension sections in our study are quite low compared to those at the University of Minnesota. As indicated earlier, our correlations were .224 for Vocabulary scores and grade point average; .111 for Comprehension scores and grade point average.

[3]James I. Brown, et al (Boston: Houghton Mifflin, 1973), pp. 29, 15.

C. Concluding Comments

Noteworthy is the fact that Fall 1975 new students at Leeward Community College differed significantly in their performance on the Nelson-Denny Reading Test based on most of the characteristics being analyzed in our Student Flow Project. (See Table 7.)

TABLE 7
STUDENT CHARACTERISTICS AND PERFORMANCE ON THE NELSON-DENNY READING TEST
LEEWARD COMMUNITY COLLEGE
FALL 1975 NEW STUDENTS

Note: Level of statistical significance is shown as follows:
* .05 level
** .01 level
*** .001 level

Characteristics	Vocabulary	Comprehension	Total
Sex		***	*
Age	***	***	**
Marital Status	***	***	
High School Background	***	***	***
Educational Objective	***	***	***
Program	***	***	***
Grade Point Average	***	***	***
Cont./Non-Cont. Status	***	**	***

An interesting result was the difference in performance on the Vocabulary and Comprehension sections, by age groups. While the older-student group (over 29 years) had the highest mean scores on the Vocabulary section, the youngest-student group (below 19 years of age) did best on the Comprehension section.

Highest scores on both sections of the Nelson-Denny Reading Test were achieved by the following groups:

—graduates from U. S. Mainland and Hawaii's private high schools

—students majoring in the liberal arts (same as those seeking AA degrees)

—students with grade point averages of 3.5 and above.

Continuing students in Spring 1976 had significantly higher mean scores than non-continuing students on both the Vocabulary and Comprehension sections.

Also of interest are the low correlations between grade point average and Reading Test scores compared to the correlation between the Vocabulary and Comprehension scores. In all programs, but hotel/food services, there was a higher correlation between grade point average and Vocabulary scores than between grade point average and Comprehension scores.

The results of this analysis indicate that students differ in their performance on the Nelson-Denny Reading Test, by various characteristics. Future additions to the Student Flow Project should include Nelson-Denny Reading Test scores if campus data are available. It may also be feasible at that time to explore the relationships between other placement tests and academic performance in the community colleges.

UNIVERSITY OF HAWAII

Office of the ~~Vice-President~~ for Community Colleges
Chancellor

April 5, 1976

MEMO TO: Mildred Kosaki

F R O M: Ken Kunisaki

SUBJECT: KINDS OF PLACEMENT TESTS ADMINISTERED BY THE CAMPUSES

As requested, I submit to you the following report on tests being administered at our various community colleges:

HONOLULU COMMUNITY COLLEGE

1. Test of Adult Basic Education = administered to all incoming students except unclassified students (only language portion of test).

2. Math Placement Test = administered to all incoming students (campus-made test).

KAPIOLANI COMMUNITY COLLEGE

1. Nelson-Denny Reading Test = placement tests for English 30, 29, 127 courses.

2. Several "in-house" placement tests for Speech, Math, Foreign Languages, English.

3. SCAT II = placement test for all Health Education majors.

4. Michigan Test of English Language Proficiency = for immigrants and Trust Territory students.

KAUAI COMMUNITY COLLEGE

1. SCAT II Tests, Forms 1A & 1B for nursing program; Forms 2A & 2B for other programs.

2. Lee-Clark Arithmetic Fundamentals Survey Test = math placement test.

3. Nelson-Denny Reading Test, Forms C & D = compulsory for all nursing majors; for others, on voluntary basis.

2327 Dole Street · Honolulu, Hawaii 96822/Cable Address: UNIHAW

Mildred Kosaki April 5, 1976

LEEWARD COMMUNITY COLLEGE

1. Nelson-Denny Reading Test, Form D = administered to all first-time, new students, part time and full time, to place students into developmental reading and writing.

2. *Algebra Placement Test = locally-developed test for algebra placement.

3. *Math Pre-test = locally-developed test.

* - students may take either test 2 or 3 with the Nelson-Denny.

MAUI COMMUNITY COLLEGE

1. California Reading Test = administered to all degree-seeking students.

2. Math Placement Test = locally-developed test.

3. Business Math Placement Test = locally-developed test.

4. Qualifying tests for English 100.

5. Test for foreign students.

WINDWARD COMMUNITY COLLEGE

1. Nelson-Denny Reading Test = administered to all incoming students.

September 10, 1976

HAWAII COMMUNITY COLLEGE

Two tests are used on a voluntary basis: California Reading Test and ETS self-scoring Math Placement Tests.

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